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Hybrid Xpanel

User Manual

HP07CD iMX35 Version

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS : (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

⚠ Caution

To use this product correctly, it is absolutely required to read the product description before use.

1. For your safety and the safe operation of this product, please read this manual before using the product. The manual is subject to change without notice.
2. Please review the product specifications in this manual to determine the suitability of this product for its intended use.
3. For your safety only qualified persons should perform electrical and wiring attchments to this product.

FCC RF
INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

MEMO

Hybrid
Xpanel

The Ultimate All-In-One Solution

The most advanced micro PLC is seamlessly integrated into the incredible HMI with vivid and sharp display

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Essential Safety Precautions

⚠ WARNING

Installation

- Please do not dissemble or modify the Hybrid Xpanel. It will void the Warranty and may cause a high voltage electric shock.
- This version of the Hybrid Xpanel is not rated for flammable environments. Do not use this Xpanel around flammable gases. It may cause an explosion.

Wiring

- To prevent an electric shock, confirm that the power supply is turned-off before making any connection to the Hybrid Xpanel.
- Do not use power beyond the specified voltage range of the Hybrid Xpanel. Doing so may cause a fire or an electric shock.

Maintenance

- The Hybrid Xpanel uses a lithium battery to back up the internal clock. Do not replace this battery yourself because it may cause an explosion. If the battery needs to be replaced, please contact your local service center.

Essential Safety Precautions

⚠ CAUTIONS

Wiring

- Field Ground (FG) wires must be run individually from each unit to the master grounding terminal. DO NOT daisy chain the FG wires between devices.
- Correctly wire the Xpanel, be sure that the rated voltage and terminal layout are within the designated range. If the voltage supplied differs from the rated voltage, or incorrect wiring or grounding is performed, it may cause a fire or unit malfunction and it will void the warranty.
- Use only the designated torque to tighten terminal block screws of the Xpanel. If these screws are not tightened firmly, it may cause a short circuit, fire or Xpanel malfunction.
- Be careful that the metal filings and wiring debris do not fall into the Xpanel, they can cause a fire, Xpanel malfunction or incorrect operation.

Maintenance

- The LCD contains a powerful irritant and if for any reason the panel is damaged and this liquid contacts any part of your body, be sure to wash that area with running water for 15 minutes. If any of this liquid enters your eye, flush your eye for 15 minutes with running water and contact a physician.

Unit Disposal

- When this unit is disposed of, it should be done so according to your country's regulation for similar types of industrial waste.

General Safety Precautions

⚠ CAUTIONS

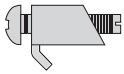
- Do not strike the touch panel with a hard or pointed object, or press on the touch panel with too much force, since it may damage the touch panel or the display.
- Do not install the Hybrid Xpanel where the ambient temperature can exceed the allowed range. Doing so may cause the Xpanel to malfunction or shorten its operation life.
- Do not restrict or limit the ventilation holes in the Hybrid Xpanel.
- Do not store the Hybrid Xpanel in an environment that exceeds the allowed range.
- Do not Use the Hybrid Xpanel in areas where large, sudden temperature changes can occur. These changes can cause condensation to form inside the unit, possibly causing the unit to malfunction.
- Do not allow water, liquids, metal or charged particles to enter inside the Xpanel, since they can cause either an Hybrid Xpanel malfunction or an electrical shock.
- Do not store or use the Hybrid Xpanel in direct sunlight, or in excessively dusty or dirty envernonments.
- Do not store or use the Hybrid Xpanel where strong jolting or excessive vibration can occur.
- Do not store or use the Hybrid Xpanel where chemicals (such as organic solvents, etc.) and acids can evaporate, or where chemicals and acids are present in the air.
- Do not use paint thinner or organic solvents to clean the Hybrid Xpanel.
- Do not store or operate the LCD display in areas receiving direct sunlight, since the sun's UV rays may cause the LCD display's quality to deteriorate.
- If you store the Hybrid Xpanel in areas where the temperature is lower than allowed level, the liquid of the LCD will congeal and the LCD can be damage. Conversely, if the storage area's temperature becomes higher than the allowed level, the liquid of the LCD will become isotropic, causing irreversible damage to the LCD. Therefore, be sure to store the panel only in areas where temperatures are within those specified in this manual.
- After turning the Hybrid Xpanel OFF, be sure to wait a few seconds before turning it ON again. If the Hybrid Xpanel started too soon, it may not start up correctly.
- Due to the possibility of unexpected accidents, you must back up the project data of the Hybrid Xpanel regularly.

Package Contents

The following items are contained in the package of the Hybrid Xpanel. Before using the Hybrid Xpanel, please confirm that all items listed here are present.

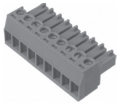
▪ Xpanel Unit

▪ Fastener



▪ Power Plug

▪ 9P Connector (PLC)



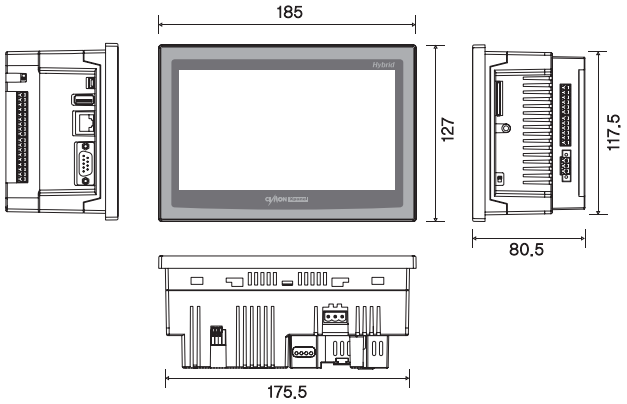
▪ Installation Guide

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local Xpanel distributor immediately.

1. Dimensions

Unit : mm

• HP07



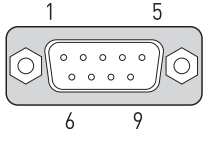
▪ The image above can be different from the real product.

2. Interfaces

1) HMI COM Port

COM1: RS-232C/422/485

•This interface is used to connect the Hybrid Xpanel to the host(PLC), via an RS-232C or RS-422/485 cable.

Connector	Pin No.	Name	Description	Port
	1	SDA	Send Data A	COM1
	2	RD	Receive Data	COM1
	3	TD	Transmit Data	COM1
	4	RDA	Receive Data A	COM1
	5	SG	Signal Ground	COM1
	6	SDB	Send Data B	COM1
	7	RTS	Request To Send	COM1
	8	CTS	Clear To Send	COM1
	9	RDB	Receive Data B	COM1

- If you connect the Hybrid Xpanel to the host via an RS-485 cable (2wire), you must connect SDA and SDB lines.
- The RS-485 of the Hybrid Xpanel runs under auto toggle mode.
- To reduce the risk of damaging the RS-422 circuit, be sure to connect the SG terminal.
- You can select only one serial communication among RS232C, RS-422 and RS-485. Those 3 communications do not work simultaneously.

2) PLC COM Port

- It is COM1 Port for PLC CPU and supports either RS232 or RS485 according to option select. It does not support both RS232 and RS485 at the same time.
- In case of RS232, Pin out is specified as shown below.

Connector	Pin No.	Name	Description	Port
	1	TD	Transmit Data	COM1
	2	RD	Receive Data	COM1
	3	SG	Signal Ground	COM1

- In case of RS485, Pin out is specified as shown below.

Connector	Pin No.	Name	Description	Port
	1	SDA	Send Data A	COM1
	2	SDB	Send Data B	COM1
	3	SG	Signal Ground	COM1

3) HMI & PLC communication interface

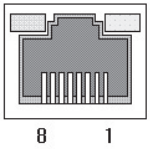
- Both HMI board (COM2) and PLC CPU board (COM2) are connected inside through RS-232.

2. Interfaces

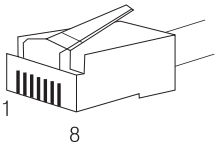
4) Ethernet

•This interface complies with the IEEE802.3 for Ethernet (10BaseT/100BaseTX).

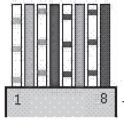
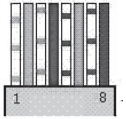
RJ45 Connector



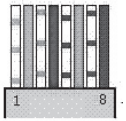
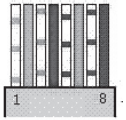
RJ45 Jack



Direct Cable : Host → HUB

Cable	No.	Color	Color	No.	Port
	1	Orange/W	Orange/W	1	
	2	Orange	Orange	2	
	3	Green/W	Green/W	3	
	4	Blue	Blue	4	
	5	Blue/W	Blue/W	5	
	6	Green	Green	6	
	7	Brown/W	Brown/W	7	
	8	Brown	Brown	8	

Crossover Cable : Host → Host

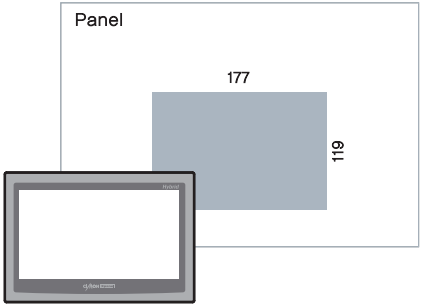
Cable	No.	Color	Color	No.	Port
	1	Orange/W	Orange/W	1	
	2	Orange	Orange	2	
	3	Green/W	Green/W	3	
	4	Blue	Blue	4	
	5	Blue/W	Blue/W	5	
	6	Green	Green	6	
	7	Brown/W	Brown/W	7	
	8	Brown	Brown	8	

3. Installation

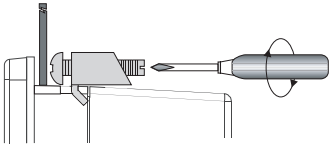
Unit : mm

• HP07

• Create a Panel Cut and insert the Xpanel into the panel from the front.



• Attach the Installation Fasteners from inside the panel Insert each the hook of faster into slot and tighten it with a screwdriver.



- Tightening the screws with too much force can damage the case of the Hybrid Xpanel.
- The necessary torque is 0.678~0.813lbf*ft (0.5~0.6 N•m)
- Depending on the thickness of installation panel, the number of installation fasteners used may need to be increased to provide the desired level of moisture resistance.

4. Wiring and Power Supply Caution

⚠ WARNING

1. To avoid an electric shock, when connecting the Hybrid Xpanel power cord terminals to the power terminal block, confirm that the Hybrid Xpanel power supply is completely turned OFF, via a breaker, or similar unit.
2. Since there is no power switch on the Hybrid Xpanel unit, be sure to attach a breaker-type switch to its power cord.

- When the FG terminals is connected, be sure the wire is grounded. Not grounding the Hybrid Xpanel unit will result in excess RF noise and the possibility of shock if there is an equipment failure.

▪ Please pay special attention to the following instructions when connecting the power cord terminals to the Hybrid Xpanel unit.

1. If the power supply voltage exceeds the GP's specified range, connect a voltage transformer and re-attach the screws.
2. Between the line and the ground, be sure to use a low noise power supply. If there is still an excessive amount of noise, connect a noise reducing transformer.
3. The power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), or input/output signal lines.
4. Connect a surge absorber to handle power surges.
5. Reduce noise, make the power cord as short as possible.

5. Grounding Caution

1. When grounding to the rear face FG terminal of the Hybrid Xpanel, (on the Power Input Terminal Block), be sure to create an exclusive ground.
2. Inside the Hybrid Xpanel unit, the SG(Signal Ground) and FG(Frame Ground) terminals are connected to each other.
3. When connecting an external device to the Hybrid Xpanel with the SG terminal, ensure that no short-circuit loop is created when you setup the system.

6. Specification

■ HMI Part

Model	HP07CD-AER HP07CD-DER	HP07CD-ANR HP07CD-DNR	HP07CD-AES HP07CD-DES	HP07CD-ANS HP07CD-DNS
LCD size	7 inch wide			
LCD Type	TFT Color			
Colors	65K Colors			
Resolution	WVGA 800X480			
Backlight	LED			
Luminance	400 cd/m^2			
Touch Panel	4 wire resistive			
Memory	128M Byte DDR2			
Storage	128M Byte SLC NAND FLASH			
SD Card	1 SD slot	None	1 SD slot	None
COM1(HMI)	RS-232C/422/485			
COM2(HMI)	RS-232(Internal)			
COM1(PLC)	RS232		RS485	
COM2(PLC)	RS232(Internal)			
Ethernet	10/100 BaseT	None	10/100 BaseT	None
USB Host	1 port			
Tool Port	1 USB device			
Audio	1 port	None	1 port	None
Rated Voltage	-A:AC100-240V / -D:DC24V			
Power Consumption	8W			
OS	Windows CE 6.0			
Dimension(mm)	185 X 127 X 80.5			
Panel Cut(mm)	177 X 119			

6. Specification

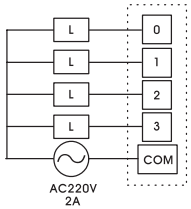
■ PLC CPU Part

Items		Specifications
Power		DC 12-24V / 10W (In case of maximum expansion)
Program control method		Cyclic execution of stored program, Time Driven Interrupt
I/O control method		Indirect method, Directed by program instruction
Program language		LD(Ladder Diagram), IL(Instruction List), SFC(Sequential Function Chart)
Data processing method		32 bit
Instructions	Sequence	55 Instruction
	Application	389 Instruction
Processing speed (Sequence)		300 ns/Step
Program capacity		15K Step
Maximum I/O points		384 points
Operation mode		Run, Stop, Remote Run, Remote Stop
Back-up method		K address by (Latch) parameter
Total program		128
Total program (Max.128)	Scan	Scan, Subroutine, Cold/Hot Start initialization, Periodic Interrupts
	Periodic Interrupts	Maximum 16 scan program (Minimum period : 10ms)
	Special	PID Control, HSC, Positioning, I/O Input Filter
	Communication	Serial, Ethernet, MODBUS/RTU Master, MODBUS TCP, High Speed Link
	Etc.	SFC, FBD (Function Block Diagram : under development)
Self-diagnosis function		Detects delay of scan time, memory, I/O, Battery, Power supply
Restart		Cold, Hot Restart
Maximum expansion		1 CPU module + maximum 11expansion modules
Data memory	X	1024 points (X0000 - X063F)
	Y	1024 points (X0000 - X063F)
	M	8192 points (M0000 - M511F)
	L	4096 points (L0000 - L255F)
	K	4096 points (K0000 - K255F)
	F	2048 points (F0000 - F127F)
	T	512 points (T0000 - T0511)
	C	512 points (C0000 - C0511)
	S	100 states x 100 set (00.00 - 99.99)
	D	10000 words (D0000 - D9999)
	Z	1024 words (Call Stack : Z0000 - Z0063, Z1000 - Z1063)
	R	16 points (Index)

6. Specification

Items	Specifications
High Speed Counter	20Kpps, 2 Phase 2Ch.(in case of operating 2Ch simultaneously 10kpps) 1Phase pulse Input + Direction signal
PID	32 Channels, Auto-Tuning
RTC	Battery (CR2032 Backup)
Communication channel	Built-in : USB Loader (for CICON program), RS232C 1CH.
	Option : RS485 1Ch or RS232 1Ch
Etc.	Real number operation, Online edit

■ PLC CPU Board I/O Specification

Items	Relay Output
Rated I/O Voltage	AC 220V / DC 24V
Rated I/O Current	1 point 2A / COM 5A
On V/A	DC 19V / 3mA
Off V/A	DC 6V / 3mA
Response time	10ms or less
Operation indicator	Input ON, LED ON
Insulation method	Relay Insulation
Input method	DC 8points (SINK/SRC)
Output method	Relay 8points
Circuit Diagram	

■ XPANEL Environmental Specification

Item	Description
Permitted Voltage	DC 24V or AC100-240V
Ambient Temperature	0℃~60℃
Storage Temperature	-10℃~60℃
Ambient Humidity	10%RH~90%RH(Non-condensing, wet bulb temperature: 39℃ max.)
Storage Humidity	10%RH~90%RH(Non-condensing, wet bulb temperature: 39℃ max.)
Air Pressure Vibration Resistance (Availment altitude)	800hPa ~ 1114hPa(Up to 2000m/6,500ft)
Dust	0.1mg/m^3 or less
Pollution Degree	Less than equal to Pollution degree 2
Corrosive gases	Free from corrosive gases
Vibration Resistance	IEC61131-2 Compliant Occasional Vibration 10Hz to 75Hz 0.075mm, 57Hz to 150Hz 9.8m/s^2 Continuous Vibration 10Hz to 75Hz 0.075mm, 57Hz to 150Hz 4.9m/s^2 X,Y,Z directions for 10 cycle (80min.)
Noise resistance	±2kV, 1uS
Electrostatic Discharge Immunity	Contact Discharge 4kV (IEC61000-4-2)
	Air Discharge 8kV

7. PLC CPU Manual

1. Device & Address

• Device

- Input : X	- Data Device : D	- Output : Y	- Sub Data Device : @D
- Sub Relay : M	- Link Relay : L	- Keep Relay : K	- Step control Relay : S
- Timer : T	- Special Relay : F	- Counter : C	- Index register : R

• Device Address

- *Bit Data: [Device] + [Card No.] + [Bit No.]*
  Device : X, Y, M, K, L, F, Card No. : 10Dec(Decimal). 3 Characters
  Bit No. : 16Hex. 1 Character
  Ex) X0100 → 10Dec. (word) + 16Hex(Last Bit)
  : [10th Address and 0th bit]

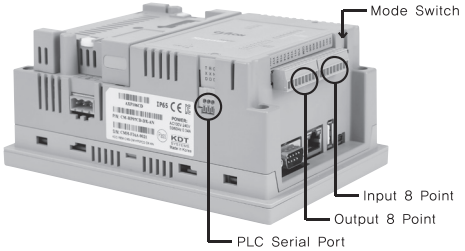
- *Word Data: [Device] + [Card No.]*
  Device : D, Z, T, C, Card No. : 10Dec. 5Characters
  Ex) D0100 -> 10Dec. (Word) : [100th word Address]

- *Timer, Counter Output: [Device] + [Bit No.]*
  Device : T. C, Bit No. : 10Dec. 4Characters
  Ex) T0100 -> 10Dec. (Word) : [T 100th Bit Address]

- *Step Controller I/O: [Device]+[Card No.]+[.]+[Step No.]*
  Device : S
  Card No. : 10Dec. 2Characters, Step No. : 10Dec. 2Characters
  Ex) Sxx.xx -> xx is 10Dec. (0~99)

- *assign Bit Device to Word: [Device] + [Card No.] + [0]*
  Device : X, Y, M, K, L, F, Card No. : 10Dec. 3Characters
  Ex) X010 -> 10Dec. (Word), [X 10th Address]

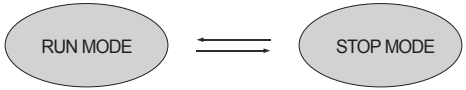
2. Names of Part and Mode Change



• There are two types of PLC CPU module.
RS232 type and RS485 type : The above picture is RS232 type.

• If EAA module (CM-HP-EAA) is installed, slot number is assigned to EAA module. If Dummy (CM-HP-DM) is installed, slot number is assigned after Dummy module. The maximum expansion modules are 2 modules (Without EAA or Dummy module).

• Mode Switch



• Operation mode is changed by mode switch.

• The mode can be changed through CICON but when power reset, RUN/STOP mode is decided through switch position.

7. PLC CPU Manual

3. Features of CPU

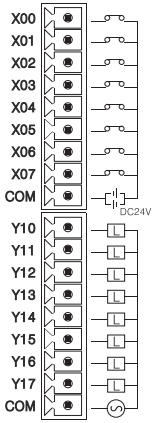
► Built-in Functions

- PID Control
  It operates 32LOOP PID without PID module.
- RTC
  It reads time from RTC and save it in F device address.
- I/O reservation.
  It scans module at designated slot.
  It refers to reservation function which writes a program without I/O change in case of expansion, damage or replacement.
- Online Edit
  Program can be edited while Run mode.

► Features

- SD/MMC Built-in.
  Scan program or firmware can be upgraded by SD memory card.
  (Stop mode → Power off → Insert SD card → Run → Stop → Run → Stop
  : firmware will be upgrade automatically.)
- 20Kpps High Speed Counter (2Channel) Built-in.
  2PH.2/4Multi. Input mode possible, Voltage input type (Open collector)
- Max.3 communications can work simultaneously.
  (Ethernet, RS232, RS485)
  CIMON HMI, MODBUS RTU/TCP, Protocol program(user protocol),
  Loader protocol support, Remote access & up/down load support.
- Abundant memory (10K Step)
- Data reserved in case of Power cut
  Built-in Flash memory enabling permanent backup of program without any seperate battery.

3. CPU I/O Pin Map



6) Safety Instructions

- Use PLC only in the environment specified in PLC manual or general standard of data sheet.
- Do not let any metallic foreign materials inside the products which may cause electric shock, fire or abnormal operation.
- Do not touch or install the module when PLC power is on.
- Do not disassemble or remodel the module.
- When F3.4(Special relay address for battery error) is on, change the battery.

8. Project Download

1. Download a Project From a PC to Xpanel using a USB Cable

(1) Requirements for Downloading

A USB-Mini(B) type cable is required. To use a USB cable, Xpanel must be synchronized with the PC. Either ActiveSync or the Mobile Device Center must be used for synchronization, depending on the version of Windows being used.

USB Cable Type	Environment	Requirement
USB-Mini(B)	Windows XP	ActiveSync
	Windows Vista/Win7/Win8	32 Bit : Mobile Device Center 32bit
		64 Bit : Mobile Device Center 64bit

► ActiveSync and Mobile Device Center can be downloaded from Microsoft. (www.microsoft.com)

(2) Connecting To Xpanel from Windows XP

A. Install the latest XpanelDesigner (available from the CIMON web site).

B. Download ActiveSync, from Microsoft and install it.

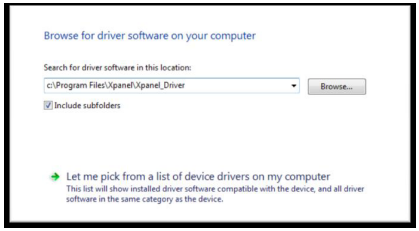
C. After installing ActiveSync, connect a USB cable to Xpanel. Select No in the New Hardware Search Wizard.

D. Default Installation Path for the Driver

Ver 2.31 : C\Xpanel\USB_Driver\XT04SyncDrv\

Ver 2.30 or earlier : C\ProgramFiles\Xpanel\USB_Driver\XT04SyncDrv\

8. Project Download



F. Installation is Complete

(3) Connecting to Xpanel from Window 7

A. Install the latest XpanelDesigner (available from the CIMON web site).

B. Download the Mobile Device Center, from Microsoft and install it.

C. After installation, connect a USB cable to Xpanel.

D. With an Internet connection, the Device Manager will synchronize with Xpanel automatically (Internet access is required).

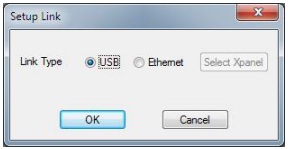
E. Installation is complete.

< Windows Mobile Device Center>

2. Download a Project From XpanelDesigner to Xpanel By USB Cable

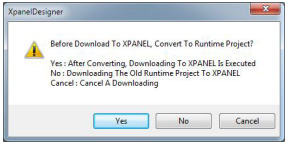
(1) Select a ConnectionType

Go to the Menu tab, and select [Online]→[Setup Link]→[USB].



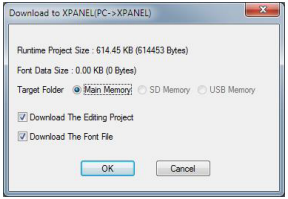
(2) Convert To a Runtime Project

For USB, select [Online]→[Download To Xpanel]. When the Converting To Runtime Project dialog appears, click on YES.



(3) Download a Project from XpanelDesigner (PC) To Xpanel.

A. First Time Download



8. Project Download

- For the initial download, the download dialog box will appear, as shown above.
- RunTime Project Size
  Display the size of the project download in Bytes.

Model	Max. Project Size	Built in Flash Size
XT04CD/XT07CD/ HP07CD/XT08CD	Up to 80 MB	128 MB
XT10CD/XT12CD/ XT15CD	Up to 50 MB	128 MB

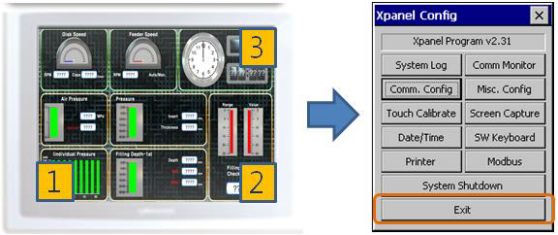
3. Download Project By Ethernet

Projects can also be downloaded to Xpanel by Ethernet (the Xpanel Ethernet option required). The Ethernet Loader (a built-in program) is used for downloading by Ethernet.
The Ethernet Loader must be running throughout the download process. If the Ethernet Loader is forced to quit, the download will be interrupted. You will then have to either run the Ethernet Loader again, or restart Xpanel.

(1) Setting the Xpanel IP address

A. Using an Ethernet Loader

a. Terminate the Xpanel Application Program (Active Project)
If you touch the three corners of the Xpanel display in the order shown below, the Xpanel Config Dialog box will appear. Click on Exit to shut down the Xpanel Application Program and bring up the Desktop.

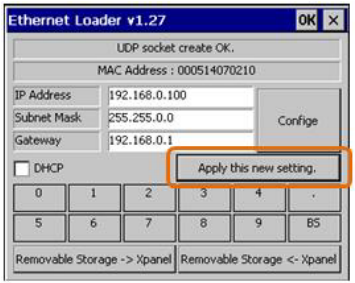


B. Checking the Ethernet Loader

The Ethernet Loader should always be running. If the Ethernet Loader is forced to quit, the download will be interrupted. if this happens, the Ethernet Loader must be started again. To do this, go to [My Device] → [Xpanel], and click on “Eldr.exe”.

C. Apply the IP setting To Xpanel.

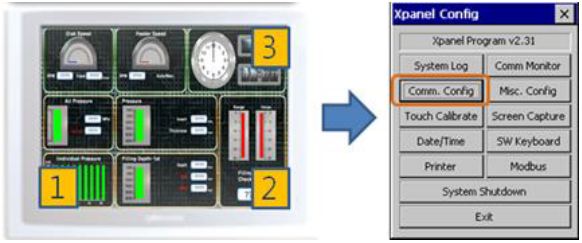
Enter the Xpanel IP address, Subnet Mask and Gate Way then click on Apply this new setting to restart Xpanel (the modified setting will be applied only after restarting).



B.Using Xpanel Config

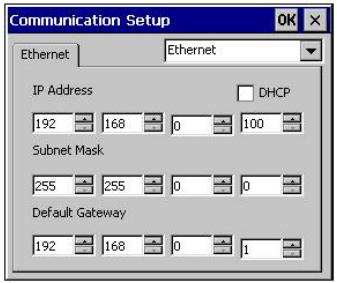
a. Open the Xpanel Config Dialog box

If you touch the three corners of the Xpanel display in the order shown below, the Xpanel Config Dialog box will appear. Click on Comm Config to bring up the IP setting dialog box.



b. Communication Setup

Select Ethernet from the Drop-Down menu. Enter the IP address for Xpanel and click on OK to execute a System Shutdown. After the System Shutdown, the modified IP setting will be applied to Xpanel.

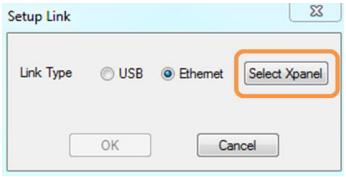


(2) Download a Project From XpanelDesigner By EthernetA.

Using an Ethernet Loader

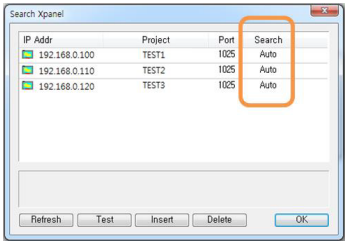
A. Select a Connection Type

Select [Online] → [Setup Link]→[Ethernet].



B. Select and Search for Xpanel

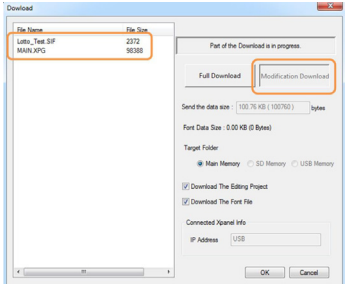
Click on Select Xpanel to bring up the list of Xpanel IPs currently connected to the PC(by Ethernet). Select the desired Xpanel IP and click on OK.



C. Download To Xpanel

Select [Online] → [Download To Xpanel].

The project is converted to an Editing Project, and the rest of the download procedure is the same as it is for Download by USB Cable.



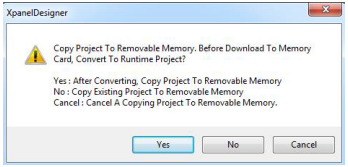
(See Download by USB Cable for the detailed information about downloading)

4. Download a Project To Xpanel using USB/SD/MMC

(1) Preparing for USB/SD/MMC

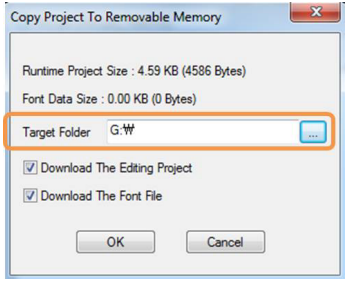
(2) Download a project to a USB/SD/MMC Device.

A. Download a project into USB/SD/MMC memory.
Select [Online] → [Copy Project to Removable Memory]. Convert the project to a Runtime Project.

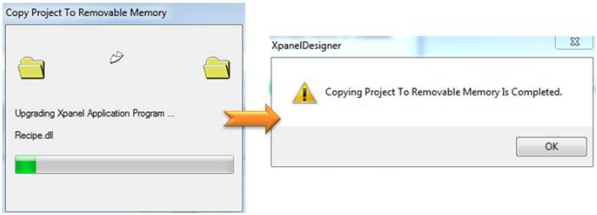


B. Select the Target USB/SD/MMC Device

Enter the location of the target USB/SD/MMC device; it must be in the Root Folder (Directory). Xpanel cannot recognize Subfolders (Subdirectories). Click on OK to download the project to Xpanel.



C. Writing a project to a USB/SD/MMC Device

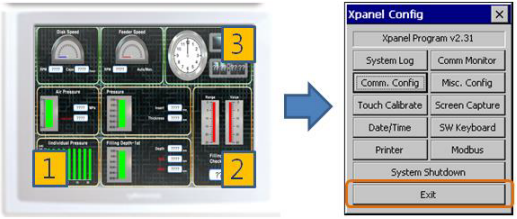


8. Project Download

D. Plug the Portable Memory Device into Xpanel.

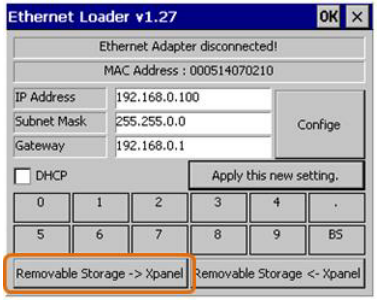
E. Close Xpanel Application Program

If you touch the three corners of the Xpanel display in the order shown below, the Xpanel Config Dialog box will appear. Click on Exit to shut down the Xpanel Application Program and bring up the Windows CE Desktop.

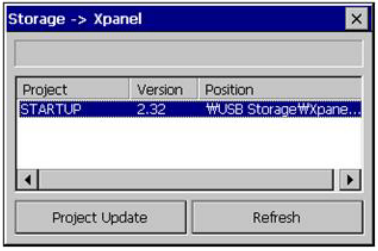


F. Writing a Project into Xpanel by Ethernet Loader

On the Windows CE Desktop, the Ethernet Loader will normally be running. The Ethernet Loader supports not only project Up/downloading via Ethernet, but also project Up/downloading via Removable Storage Device.



Select [Removable Storage → Xpanel] on the Ethernet Loader.



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January 2014

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Revision History

Version	Date	Content	Page
V1.0	2014-03-24	New version	-

CIMON CO.,LTD.

H.Q Address : 5F KDT B/D, #48, Beolmal-ro, Bundang-gu,Seongnam-si, GyeongGi-do, Korea, 463-836

Tel : +82-31-778-3071

Homepage : www.cimon.com

USA : 3699 Wilshire Blvd suite 1250 Los Angeles CA90010

Tel : 213 384-8703

Homepage : www.cimon.com

BXP13018

Version:1.0

Revision Date : Mar, 2014